



Guidelines for the Disposal of Seeds Treated with Plant Protection Products

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Guidelines and their Purpose

Commitment is needed from all stakeholders in the treated seed supply chain for the production of high quality treated seed, its safe handling, and disposal.

The following guidelines have been developed to act as a benchmark for the various parties that participate in the Seed Treatment Industry. As detailed in the guidelines, each party has a responsibility to promote safe and environmentally sustainable practices.

These guidelines are not intended to serve as a legal reference. They are not binding on ISF members. Local and national regulations must always be complied with.

ISF has published other Guidelines related to seed treatment application technologies, so you may want to refer to them also.

Disclaimer

This guideline has been developed by ISF based on the last available technical information and current knowledge for information purposes only. ISF does not guarantee that the information included in this guideline is complete, accurate and up to date. This guideline is not intended as and should not be considered as legally binding rules. The user of the information in this guideline is at all times responsible for checking and adhering to the applicable laws and regulations.

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Guidelines and their Objective

This paper has been developed in response to numerous questions about the disposal of seeds treated with Plant Protection Products (PPP)¹ and are no longer fit for their intended purpose. Treated seed disposal is difficult to address because the products and the relevant regulations vary significantly from country to country.

The objective of this paper is to outline disposal options that minimize environmental impact and are sustainable. It provides guidelines, particularly for situations without relevant regulations. In all cases, disposal options of treated seeds are based on the crop protection products involved and should therefore be discussed with the respective Crop Protection Company and relevant authority in the country of disposal. This paper is directed to all parties handling treated seeds including growers who may find themselves with inventories of obsolete treated seeds.

This paper is not intended to serve as a legal reference. ISF does not accept any liability for decisions taken with reference to this document.

Background

Seed-borne and early season diseases and insect pests can pose devastating consequences to crop production if not properly managed. Seed Applied Technologies have played a significant role in the history of humankind and are currently used to improve the establishment of healthy crops leading to better yields.

Seed Applied Technologies are the interface of the seed, crop protection, and seed enhancement industries. PPPs and biologicals are applied to seeds to protect against disease, nematode, and insect pests. Seed and seedling performance can also be enhanced by adding products like micronutrients or growth stimulants or by performing specific processes on seed such as priming or disinfecting.

Seed treated with PPPs or other additives must be handled according to the specific regulations for the seed treatment product used. If the treated seed is not used for its intended purpose, disposal must follow its' specific regulations where they exist. Where no regulations exist, these Guidelines may be used to develop sustainable solutions by stakeholders.

Government Regulations

All parties handling treated seeds should know which national and local government agencies regulate the disposal of treated seeds and use them as source of information. It is imperative that all stakeholders understand the laws and regulations associated with the

¹ Whenever Plant Protection Products or PPPs are mentioned this does mean: Insecticides, Fungicides, Stickers, Colorants and other additives as biological, micronutrients, growth stimulants, etc.

application and disposal of seed treatment products. Negligence in following these laws can potentially result in fines, penalties and imprisonment.

By developing an understanding of the regulations and the responsibilities of the government agencies involved, a seed handling party can define potential disposal options and implement a pragmatic, lawful and sustainable solution acceptable even where no regulations exist. The expertise and understanding gained will allow constructive contributions to the public processes used in the development of new regulations and new avenues of disposal. Working together with manufacturers and regulators is the best way to guarantee transparency, agree on best practices, and assure protection of the environment.

Best Practices for Seed Production

Minimizing the amount of treated seed that needs to be discarded should always be the first priority. Seed handling parties should consider business systems including a Quality Management (QM) approach to seed treatments. This would include steps such as rationalizing the sales forecasts and production process and moving to "just in time" treatment to minimize the amount of seed treated but never planted.

Additional best practices are described in the "Industry Guidelines for Good Use Practices and Standard Requirements in the use of Seed Treatments" brochure published by ISF.

Product Identification and Tracking

When possible all parties handling treated seed should take a cradle to grave approach identifying and tracking all products, from purchase to planting or disposal. This would be active tracking of all PPP quantities purchased, the PPP amounts applied to each seed batch and the final destination of those seed batches. This tracking would include any amounts of PPP that need to be handled separately from the seed. This type of a "best practice" approach is increasingly part of the regulatory expectations in many countries.

Records may include but are not limited to documents such as purchase orders, treatment work orders, treatment records, packaging records, seed batch characteristics records, seed labeling, seed shipment documents, final destination certificates, contracts with Disposal Agents and copies of environmental permits from the Disposal Agents.

Validation of the Disposal Agents

There may be a number of different options for the disposal of treated seeds. As stated earlier, these options are dependent upon national and local regulations and the seed and PPP being used.

In all cases, the seed handling parties should validate the Disposal Agents' authorization and capabilities for handling the materials to be discarded.

The following is a checklist of issues to consider:

- 1) Ensure the Disposal Agent has all the necessary national and local permits to accept and handle the materials being disposed.
- 2) Regardless of the permits, consider the environmental impact (air, water, soil) of this disposal method and ensure you are satisfied with this option compared with the alternatives.
- 3) Ensure the Disposal Agent has adequate systems in place to provide a safe and healthy work environment.
- 4) Determine the volumes/capacity of the facility and their schedule for accepting product versus your requirements
- 5) Determine what security measures and controls the operation has in place to ensure the material is disposed as agreed upon.
- 6) Develop a contract with the Disposal Agent that identifies the responsibilities of each party in the event of misuse or mishandling of the treated seeds by the Disposal Agent.

Disposal Options

The following is a list of potential disposal options. The use of these options is dependent upon the treated seed being discarded in accordance with the national and local regulations. Seed handling parties should work with their crop protection product manufacturer to identify the most appropriate disposal options based on the PPPs' active ingredient(s) (a.i.) and rate(s). The following list is provided only as a starting point for a discussion with the appropriate regulatory authorities and is not ranked by priority. In any case the complete disposal management plan should be documented since transparency protects all parties involved.

Disposal of Quantities of PPP-Treated Seed

For disposal of leftover PPP-treated seed that cannot be planted, contact the plant protection product manufacturer for information specific to your treatment products.

Consult first with your local authorities to ensure that you are in compliance with appropriate regulations. There are a variety of industries that may be able to dispose of treated seed. However, a definitive answer on whether a sanitary landfill, power plant, cement kiln, waste management facility, or ethanol plant can legally take treated seed can only be obtained by contacting the specific facility.

1. Disposal in an Approved Sanitary Landfill

Disposal in approved sanitary landfills is permitted in some countries. However, landfill disposal is costly and usually not practical for large volumes of treated seed, and permits may be required. Disposal in landfills also may require special packaging that will increase cost.

Check the status of each active ingredient regarding its waste classification status before committing to a disposal process. PPP-treated seeds may be handled as normal solid waste or as hazardous waste, depending on the active ingredients (a.i.). Always check local regulations prior to disposing of PPP-treated seed or dust.

2. Use as a Fuel Source for Power Plants or Cement Kilns

There are a variety of power plants that utilize alternative fuels from biomass, municipal solid waste, or non-fossil waste.

These operations generally operate at very high temperatures and the incineration of material is complete. Such type of installation needs to have appropriate environmental control systems in place.

Since the seed is a renewable energy source to replace hydrocarbon fuels, the cost of the disposal might be relatively low compared to a hazardous waste facility.

The deliverer of treated seed must ensure that these facilities have the required permit for handling PPP-treated seed.

3. High Temperature Incineration by a Waste Management Facility

There are authorized hazardous waste facilities that accept certain PPP's and incinerate them.

These organizations are in the business of handling hazardous waste and therefore should have documented and controlled processes.

These operations generally work at very high temperatures and the incineration of materials is complete. Such type of installation needs to have appropriate environmental control systems in place.

Contact the waste management facility to determine if it can accept seed treated with the PPP products you have applied.

4. Fermentation in an Alcohol-Producing Process at an Ethanol Plant

Some ethanol plants have the capability to use PPP-treated seeds in their alcohol production facilities. Ethanol plants cannot use PPP-treated seeds in the fermentation process if the distillers' grain or mash is sold as animal feed. Also no measurable residues of the pesticide can remain in the ethanol by-products if they are used in agronomic practice (example: soil amendment).

Some ethanol plants can also use treated seed as an alternate power source.

Since most ethanol plants are not in the business of handling waste materials, the deliverer of treated seed must ensure that these facilities have the required permit for handling PPP-treated seed. Complete documentation should be requested.

5. Disposal of Packaging Material

Disposal of Bags that Contained Treated Seed

Used seed bags will contain some treated seed dust and/or treated seed. Always check state and local regulations prior to disposing of these contaminated bags.

In the absence of specific regulations:

- Used bags may be incinerated either in a permitted hazardous waste incinerator or municipal solid waste incinerator with appropriate air emissions control equipment.
- Used treated seed bags may be burnt as a fuel for power or industrial heat generation at facilities with proper permits.
- Landfills may be used as a last resort and only in a lined landfill with leachate collection and treatment
- Do **not** send used seed bags anywhere for recycling.

What not to do with PPP-Treated Seed or By-product

1. Composting

Composting is never recommended for treated seed.

2. Spreading and Incorporating into Soil

Spreading and incorporating (by disking, etc.) is not recommended for large quantities of treated seed, even with proper incorporation (soil coverage). It is important to contact the pesticide manufacturer(s) to determine if spreading and incorporating may be possible under a specific set of circumstances (active ingredients, pesticide and seed rates, previous and future crops, etc.)

3. Land Application of Wastewater from Facilities Accepting Treated Seed

Land application of resultant wastewater that has not met local standards is never recommended. Minimize wastewater by process recycling and dispose of any remaining material as a non-hazardous waste, e.g. by solidification and disposal in a landfill or incinerator having the required permits. Alternatively, there are systems for treating PPP-containing liquid waste by flocculation/filtration to remove solids (which still have to be disposed of as a waste) followed by carbon treatment, which would allow the reuse of the water. Comply with all applicable environmental regulations.

4. Use of Mash or Distillers Grains as Feed

If treated seed is fermented in an alcohol-producing process, the mash or distillers grains should never be used as feed.

5. *Burning in a Wood or Corn Stove used in the Home or Shop for Heating or Cooking*

Never burn PPP-treated seeds in a wood or corn stove used in the home or shop for heating, cooking, etc.: the hazards and risks from burning treated seed in this way are unknown.

Final remarks

Government regulations, the willingness of the manufacturer to perform detailed residue analyses, and the interest of the disposal facility will have great impact on whether a disposal method can be utilized.

For all listed options, the method of disposal has to be transparent. Consultation with the manufacturer of the involved plant protection product is a prerequisite and agreement of authorities a necessity. In case of uncertainty or in absence of official approval of a disposal method, high temperature incineration is the most appropriate method.

This document has been developed based on the technical state of the art and knowledge. It does not discharge anybody from the responsibility to check and respect the regulatory framework of the country of activity and application.

In particular it cannot be precluded that perceptions of authors necessitate a different execution or further procedures. ISF and the authors cannot be held liable for any possible claims connected with the application of this guideline.